User's Manual

VIA *K8T890* mainboard for AMD Socket 754 based Athlon 64 processor

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Manual Revision 1.1 August 22, 2005

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80 Port Frequently Asked Questions

Below is a list of some basic POST Codes, possible problems and solutions. For more detailed information about POST Codes, refer to Appendix C in this manual.

POST CODE	Problem	Solution
FFh or CFh	1.BIOS chip inserted incorrectly 2. Incorrect BIOS update version 3. Mainboard problem 4. Add-on card inserted incorrectly.	1. Reinsert the BIOS chip 2. Download the correct BIOS version update from the manufacturer's Web site. 3. Replace mainboard 4. Remove and replace the add-on card
C1h - C5h	Memory module inserted incorrectly Memory compatibility problem Memory module damaged	Reinsert memory module Replace memory with correct type Replace memory module
2Dh	Error occured in VGA BIOS VGA card inserted incorrectly	Replace VGA card Reinsert the VGA card
26h	Overclock error	Clear CMOS or press the insert key to power on the system
07h - 12h	Initial Keyboard controller error RTC error	Ensure that the keyboard and mouse are connected correctly. Replace the RTC battery.

Table of Contents

		Page
Section 1	Introduction	
	Package Contents	1-1
	Mainboard Features	1-2
	System Block Diagram	1-5
Section 2	Specification	
	Mainboard Specification	2-1
Section 3	Installation	
	Mainboard Layout	3-1
	Easy Installation Procedure	3-2
	CPU Insertion	3-2
	Jumper Settings	3-4
	System Memory Configuration	3-5
	Expansion Slots	3-6
	Device Connectors	3-7
	Power-On/Off(Remote)	3-13
	External Modem Ring-in Power ON and	
	Keyboard Power ON Function (KBPO)	3-13
	ACPI S3 (Suspend To RAM) Function	3-14
Section 4	BIOS Setup	
	Main Menu	4-1
	Standard CMOS Setup	4-2
	Advanced BIOS Features	4-3
	Advanced Chipset Features	4-5
	Integrated Peripherals	4-10
	Power Management Setup	4-14
	PNP/PCI Configuration	4-17
	PC Health Status	4-18

	Power BIOS Features	4- 19
	Defaults Menu	4-22
	Supervisor/User Password Setting	4-23
	Exit Selecting	4-24
Section 5	RAID Configuration	
	Introduction	5-1
	VIA RAID Features	5-3
	Enable RAID Function	5-4
Section 6	Driver Installation	
	Easy Driver Installation	6-1
	Realtek Sound Manager Quick User guide	6-2
Appendix	Appendix A	
	Update Your System BIOS	A- 1
	Appendix B	
	VIA RAID BIOS Utility	B- 1
	Appendix C	
	POST Codes	C-1

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Section 1 INTRODUCTION

1-1 Package Contents

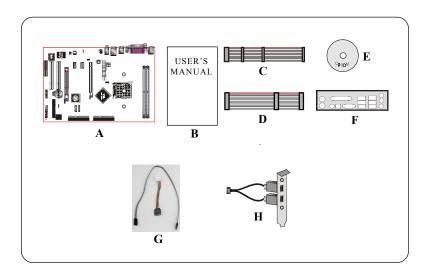
Contents

- A. Mainboard
- B. User's manual
- C. Floppy drive cable
- D. HDD drive cable
- E. CD (drivers and utilities)
- F. I/O Shield
- G .S-ATA data and power cable

Optional Items

H. Extra USB2.0 port cable

If you need the optional item, please contact your dealer for assistance.



1-2 Mainboard Features

Brief Introduction

★ Athlon™ 64 Processor

The AMD Athlon[™] 64 processor family is designed to support performance desktop. It provides a high performance HyperTransport[™] link to I/O, as well as a single 64-bit high-performance DDR memory controller.

For more information about all the new features AthlonTM 64 Processor deliver, check out the AMD website at http://www.amd.com

★ Chipset

The board is designed with VIA chipset, K8T890 as North Bridge and VT8237R as South Bridge, providing a feature rich and scalable platform.

For more information about the new features VIA Chipset, check out the AMD website at http://www.via.com

★ PCI-Express (PCI-E)

Next generation peripheral interface to succeed to current PCI bus for the next decade. With smaller slot size and 250MB/sec(PCI-E*1) or 4GB/sec(PCI-E*16) maximum transfer, PCI-Express overcomes PCI bus bottleneck.

★ Hardware Monitoring

Hardware monitoring enables you to monitor various aspects of the system operation and status. This includes CPU temperature, voltage and fan speed in RPMs.

★ 10/100 LAN

This mainboard is mounted with a ethernet LAN PHY. It allows the mainboard to connect to a local area network by means of a network hub.

★ Serial ATA

Support Serial ATA, an evolutionary replacement for Parallel ATA IDE storage interface. Increases the peak data transfer speed up to 150MB/sec and allows future enhancements to the computing platform.

* S-ATA RAID

RAID function available on chipset S-ATA ports.

★ USB2.0

A popular USB standard for plugging in peripherals with up to 480Mbps transfer speed while maintaining backward compatibility with older USB1.1 device.

* 6ch

Mainboard is equipped with 6 channel of audio to support Dolby Digital 5.1 audio for DVD-playback. The onboard audio jacks can be configured for normal 2 channel mode or 6 channel mode.

★ AMD Cool'n'Quiet™ Technology

AMD's Cool'n'Quiet[™] Technology lowers CPU operating voltage when the system is in idle mode. This helps to reduce heat dissipation and in effect lowers the fan speed to noise from your PC. To enable Cool'n'Quiet[™] the BIOS must support this feature.

Special Features

BIOS Features:

Magic Health

Reports your system hardware status for every boot-up to help detect faults early. Monitor hardware status including CPU temperature, CPU/Memory/ Chipset voltage, fan RPM speed for chassis fan, CPU fan supply fan.

♠ EZ-Boot

Simply press "ESC" to select your bootable device. No more hassle to search the BIOS menu, change and re-start.

♦ PowerBIOS

Supporting a full range of overclocking setting via BIOS. Various adjustable feature include FSB/Chipset/Memory voltage tweaking.

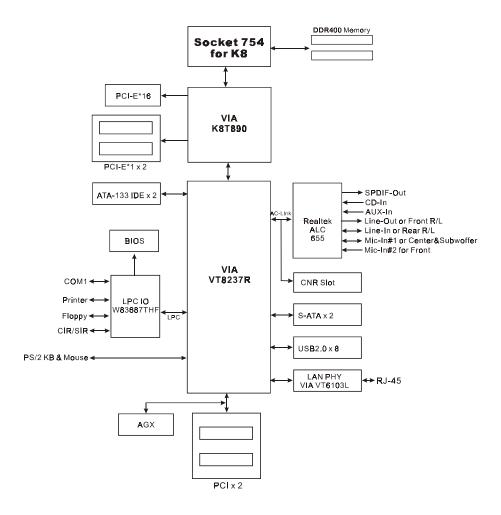
H/W Features:

An onboard LED-display trouble-shooting device, facilitating user to detect boot-up problems.

♦ QuickSPDIF

On board SPDIF-out connector for quick connection to multi-channel speakers. Not only removes cable cluttering but also delivers loss-free digital audio to let you enjoy DVD movies and games with crystal clear sound.

1-3 System Block Diagram



☐ The following table of VGA cards have been tested compatible with this mainboard.

4X AGP Card		
nVidia Geforce 2	ELSA MX-400 32MB	
	ELSA MX-460 64MB DDR GLADIAC 517VIVO	
nVidia Geforce 4	ASUS TI-4400 128MB V8440	
	APT MVGA-NVG25 BAUTi-4600 128MB	
ATI	ATI Radeon 8500DDR 64MB	
	8X AGP Card	
	Albatron GeForce FX5200EP 128MB DDR	
	Ennyah EF550 G FX5500128MB DDR TV+DVI	
nVidia Geforce FX	Ennyah EF570 Geforce FX5700 128MB DDR TV+DVI	
nvidia Geforce FX	ELSA Gladiac FX736EX Geforce FX5700/Ultra128MB DDR TV+DVI	
	ASUS Geforce FX5600/V9560XT/TD/N/128M/A	
	ASUS Geforce FX5700/Ultra V9570/TD/N/128M/A	
nVidia Geforce 4	Geforce4 MX 440 64MB/TV-Out	
	EM4000L GF4 MX4000L 128M DDR TV	
	Ennyah GF4 MX440B-8X 64MB DDR TV	

ATi AGP8X not recommended to use on AGX slot.

Section 2 SPECIFICATION

Mainboard Specification

Processor

 Support Socket-754 based AMD Athlon-64/Sempron 1.6GTs Hyper Transport processors with up to 3700+

Chipset

VIA K8T890 + VT8237R Chipset

Main Memory

- Two 184-pin DDR SDRAM DIMM sockets
- Support single or double sided 2.5v DDR-266/333/400 DIMMs architecture in 128/256/512Mb technologies
- Supports up to 2GB memory size

Expansion Slots

- One PCI-E x16 connectors compliant with PCI Express 1.0a
- Two PCI-E x1 connectors compliant with PCI Express 1.0a
- One 1.5v AGX (Advanced Graphics Xtender) connector compliant with AGP-4X/8X
- Two PCI connectors compliant with PCI v2.3
- One CNR (Communication & Networking Riser) slot for V.92 analog Modem in Secondary mode

USB

• Eight USB connectors compliant with USB2.0 from embedded USB controller (4 connectors at rear panel)

P-ATA IDE

◆ Two IDE ports (up to 4 IDE devices) with UDMA-33, ATA-66/100/133 support from embedded IDE controller

Specification

S-ATA RAID

 Two S-ATA ports from VT8237R with up to 150MBps bandwidth with RAID 0,1, Smart RAID (by VIA)

LAN

• 10/100Mbps Fast Ethernet with onboard VIA VT6103L LAN PHY

Audio

- Selectable 2, 6 channel audio from onboard RealTek ALC655 AC'97 v2.3 compliant CODEC
 - Support Aux-In, CD-In
 - Coaxial S/PDIF-out available on rear panel
 - Support Auto Jack Sensing for fool-proof audio device installation
 - Rear panel audio jacks configuration:

Audio Jack Color	2 channel	6 channel
Light Blue	Line-in	Rear stereo-out
Lime	Line-out	Front stereo-out
Pink	Mic-in	Center&Subwoofer

I/O

- Onboard Winbond **W83687THF** LPC I/O controller
- Legacy peripheral interface for FDD, Parallel, Serial, and IrDA (v1.0 compliant)
- Support Hardware Monitoring for fan speed monitoring, CPU/System temperature

BIOS

- Flash EEPROM with Award Plug&Play BIOS
- Support ACPI S3 (Suspend To RAM) mode in ACPI compliant O/S
- Support **EZ Boot** for fast bootable device selection
- Support **Magic Health** for system hardware status report during system boot-up

Peripheral Interfaces

At Rear Panel

- PS/2 keyboard and mouse ports
- One Parallel (printer) port
- One S/PDIF-Out Coaxial jack
- One Serial port
- One RJ45 LAN connector
- Four USB2.0 ports
- Three Audio jacks

Onboard connector and pin-header

- One floppy drive connector
- Two ATA-100/133 IDE connector
- Four extra USB2.0 ports
- One CD-IN and AUX-IN connector
- One IR connector
- Two S-ATA connectors
- Two Fan connectors

Front Panel Controller

- Supports Reset & Soft-Off switches
- Supports HDD & Power LEDs
- Supports PC speaker
- ◆ Supports Front Panel Audio connector

Special Features

- Support KBPO function Keyboard power on, turn on the computer from keyboard
- Support Wake-On-LAN by PME
- Support USB resume in S3
- Onboard 80 Port LED display for system debugging

Specification

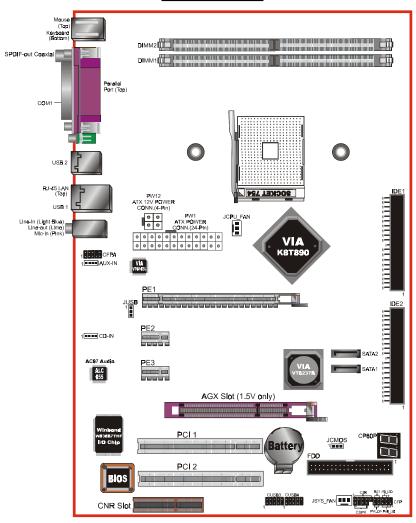
- Supports "Cool'n' Quiet" power saving technology
- **Power BIOS** for excellent over clocking features:
 - Support Asynchronous FSB/DIMM timing mode
 - Support BIOS adjustable CPU clock and voltage, chipset voltage, DIMM frequency and voltage settings.

Form Factor

• 305mm x 220 mm ATX size

Section 3 INSTALLATION

Mainboard Layout

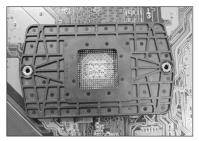


Easy Installation Procedure

The following must be completed before powering on your new system:

- 3-1. CPU Installation
- 3-2. Jumper Settings
- 3-3. System Memory
- 3-4. Expansion Slots
- 3-5. Device Connectors

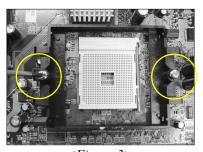
3-1 CPU Installation



<Figure 1>

Step 1

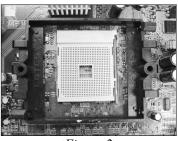
Place the back plate into the two holes around the CPU area behind the mainboard.



<Figure 3>

Step 3

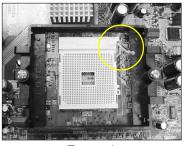
Screw in the two pan head screws.



<Figure 2>

Step 2

Place the retention mechanism on the mainboard as shown.



<Figure 4>

Step 4

Open the socket by raising the actuation lever.

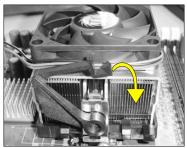


< Figure 5>

Step 5

Align pin 1 on the CPU with pin 1 on the CPU socket and gently insert the CPU. The CPU is keyed to prevent incorrect insertion. Do not force the processor into the socket. If it does not go in easily, check for mis-orientation and reinsert the CPU.

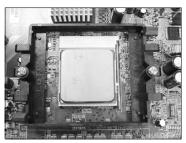
Make sure the processor is fully inserted into the socket.



<Figure 7>

Step 7

Insert the heatsink as shown above. Press the clips in the direction of the arrows shown in Figure 7 to secure the assembly to the CPU socket.



<Figure 6>

Step 6

Close the socket by lowering and locking the actuation lever.

Apply thermal compound to the top of the CPU.

Note:

Thermal compound and qualified heatsink recommended by AMD are a must to avoid CPU overheat damage.



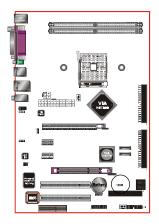
<Figure 8>

Step 9

Plug the CPU fan power into the mainboard's CPU fan connector.

The installation is complete.

3-2 Jumper Settings



JCMOS: Clear CMOS data Jumper

If the CMOS data becomes corrupted or
you forgot the supervisor or user
password, clear the CMOS data to
reconfigure the system back to the



Settings:

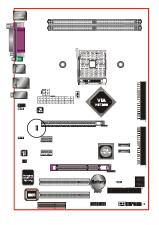
1-2: Normal (Default)

2-3: Clear CMOS

default values stored in the ROM BIOS.

To CMOS Clear data, please follow the steps below.

- 1. Turn off the system.
- 2. Change the jumper from "1-2" to "2-3" position for a few seconds.
- 3. Replace the jumper back to the "1-2" position.
- 4. Turn on the system and hold down the key to enter BIOS setup.



JUSB: USB S3 Wake up Jumper

This jumper disconnects 5V standby voltage to USB devices. This means USB devices will not be able to wake-up the system from S3 (Suspend to RAM) power saving mode.



Settings:

1-2: Connect (S3 enabled)

2-3: Disconnect (No S3)

3-3 System Memory Configuration

Memory Layout

The mainboard accommodates two PC2100/PC2700/PC3200 184-pin DIMMs (Dual Inline Memory Modules):

- Supports up to 2.0GB of 266/333/400MHz DDR SDRAM.
- The DDR400 only support two maximum unbuffered DIMMs and not available on registered DIMMs.
- Supports unbuffered DIMM configurations defined in JEDEC DDR DIMM specification.

DDR DIMM 1	<figure 9=""></figure>
DDR DIMM 2	

Memory configurations supported:

Slot No	1 DIMM		2 DIMMs
DIMM#1	DS/SS		DS/SS
DIMM#2		DS/SS	DS/SS

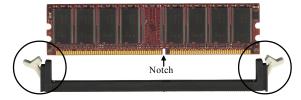
^{*} DS - Double-sided DIMM, * SS - Single-sided DIMM

NOTES:

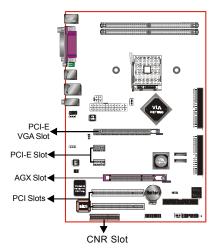
• Using non-compliant memory with higher bus speeds (overclocking) may severely compromise the integrity of the system.

Memory Installation:

- To install, align the notch on the DIMM module with the connector.
- Press straight down as shown in the figure below until the white clips close and the module fits tightly into the DIMM socket.



3-4 Expansion Slots



PCI-E VGA Slots

The elongated PCI-E*16 is intended for PCI-E VGA card installation.

PCI-E Slots

The mainboard is equipped with two PCI-E*1 compliant with PCI Express 1.0a.

AGX Slot

The mainboard is equipped with an AGX slot. Make sure you install a card that supports the 1.5V specification.

PCI Slots

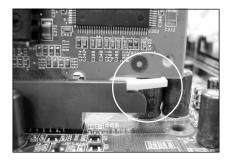
The mainboard is equipped with two PCI slots.

CNR Slot

The mainboard is equipped with 1 CNR slot.

VGA Card Installation Caution

- 1. Remove the bracket (on the PC case) for the slot you intend to use.
- 2. Firmly press down the card into the slot until it is completely seated. Ensure the VGA slot clicker is locked as shown in the picture below.



3. Secure the card's bracket to the PC case with a screw.

3-5 Device Connectors

The I/O back panel for this mainboard is shown below. When installing the mainboard into the computer case, use the bundled I/O shield to protect this back panel.

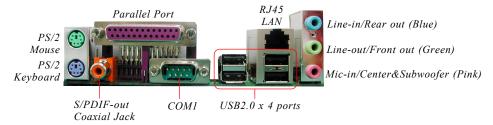
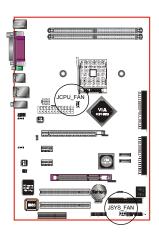


Figure 10 - I/O Ports



JCPU FAN/ JSYS FAN:

CPU/Chassis Fan Power Connectors

JCPU FAN: The CPU must be kept cool by using a

heatsink with fan assembly.

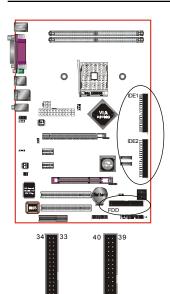
JSYS FAN: The chassis fan will provide adequate

airflow throughout the chassis to prevent overheating the CPU.



The system is capable of monitoring the fan speed in RPM (Revolutions Per Minute). Refer to the PC Health Status submenu of the BIOS for the current speed of the CPU fan, and chassis fan.

Installation

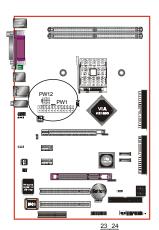


FDD: Floppy Controller Connector This connects to the floppy disk drive.

IDE1/IDE2: Ultra DMA-100/133 Primary/Secondary IDE Connector

This mainboard is equipped with 2 IDE connectors to support up to 4 ATA-100/133 IDE drives. It supports PIO and DMA mode operations for maximum data transfer rate of 133MB/sec per channel.

When using two IDE drives on the same connector, one must be set to Master mode and the other to Slave mode. Refer to your disk drive user's manual for details.



IDE1/IDE2

FDD

3.3V 0 Ground +12V +5V +12V +5V 5VSB 0 0 +5V PW-OK 0 0 -5V Ground 9 9 Ground Ground PS-ON PW12 9 9 3.3V PW1

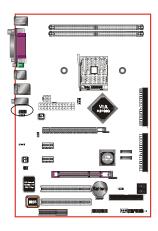
PW1: 24-pin ATX Power Connector

PW12: 4-pin ATX12V Power Connector

The mainboard is equipped with a standard 24-pin ATX main power connector and a 4-pin +12V power connector for connecting an ATX12V power supply. The plugs of the power cables are designed to fit in only one orientation. Insert the plugs into the connectors until they fit in place.

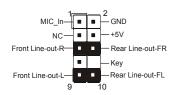
Caution:
The PW1 and PW12 Power Connector must be used simultaneously.

The board requires a minimum of 300 Watt power supply to operate. Your system configuration (amount of memory, add-in cards, peripherals, etc.) may exceed this minimum power requirement. To ensure that adequate power, use a 350 Watt or greater power supply.



CFPA: Front Panel Audio Connector

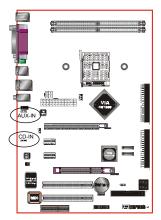
When the jumpers are removed this connector can be used for front panel audio. The front panel phone jack should have "normal close" switch. Without phone plug inserted, the rear panel audio is enabled. With phone plug inserted, the rear panel audio will be disabled.



Settings

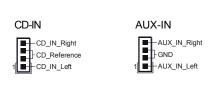
Pins (5-6) & (9-10) Short (default): Only the onboard rear panel audio jack can be used.

Pins (5-6) & (9-10) Open: Only front panel audio jack can be used.

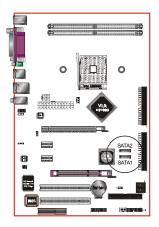


CD-IN/AUX-IN: CD Audio IN Connector

The CD-IN and AUX-IN connectors are used to receive audio form a CD-ROM drive, TV tuner or MPEG card.



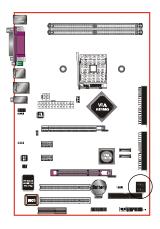
Installation



SATA1 / SATA2: Two Serial ATA Connectors

These connectors enable you to connect Serial ATA devices that conform to the Serial ATA specification.



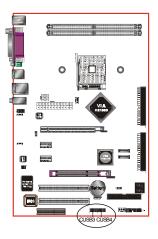


CP80P: 80 Port Debug LED

Provides two-digit POST code to show why the system fail to boot. Allows quick and easy optimization.



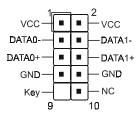
80 Port Debug 7-segment LED display (Refer to Appendix C for POST codes)



CUSB3/CUSB4: Four USB 2.0 ports

This mainboard includes additional USB2.0 ports, identified by two 10-pin connector.

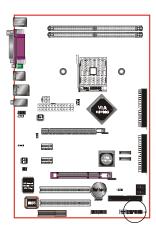
If you wish to use the additional USB ports, install the card-edge bracket to the system chassis then insert its cables to this 10-pin connector.



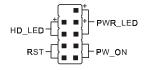
CAUTION!

Please make sure the USB cable has the same pin assignment. A different pin assignment may cause damage to the system. If you need the USB cable, please contact our retailer.

Installation



CFP



CIR



CSPK



CFP: Front Panel Connector

• HD LED

This LED will light up whenever the hard drive is being accessed.

• PWR LED

This connects to the power button of the system chassis

• RST

This switch allows you to reboot without having to power off the system thus prolonging the life of the power supply or system.

• PW ON

This is connected to the power button on the case. To use the Soft-Off by PWR-BTTN feature, refer to the Power Management Setup in the BIOS setup section of this manual.

CIR: IR connector

Connect the IrDA cable (if available) to this IR connector.

CSPK: Speaker

Connect to the system's speaker for beeping

3-6 Power-On/Off (Remote)

This board has a 24-pin ATX and a 4-pin ATX12V power supply connector to support power supplies with **Remote On/Off** feature. The 4-pin ATX12V connector must be plugged in for the system to operate safely. The chassis power button should be connected to the mainboard front panel PW ON header.

You can turn off the system in two ways: by pressing the front panel power On/Off button or using the "Soft Off" function that can be controlled by an operating system such as Windows®XP/ME/2000/98.

Note: For maintaining the DDR SDRAM power during STR (ACPI S3) function, it is strongly recommended to use power supplies that have a +5VSB current of (>=) 2A. Please check the 5VSB's specification printed on the power supply's outer case.

Note: The board requires a minimum of 300 Watt power supply to operate. Your system configuration (amount of memory, add-in cards, peripherals, etc.) may exceed this minimum power requirement. To ensure that adequate power, use a 350 Watt (or higher) power supply.

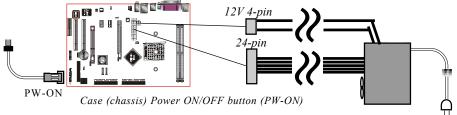


Figure 10: Simple ATX power ON/OFF controller

3-7 External Modem Ring-in Power ON and Keyboard Power ON Functions (KBPO)

Modem-Ring Power ON Function

The mainboard supports External Modem Ring-in Power ON function. Once you connect an external modem to COM port, you can turn on the system through remote and host dial-up control.

Keyboard Power ON Function

The mainboard features a keyboard power on function to turn on the power supply using a keypress. Refer to the Power Management Setup in the BIOS setup section for details. To enable this feature, the BIOS default setting is Keyboard Hot Key ($\langle \text{Ctrl} \rangle + \langle \text{F1} \rangle$). To power off the system, use the Soft-OFF function under Windows XP/ME/2000/98. (refer to Windows online help).

3-8 ACPI S3 (Suspend To RAM) Function

This mainboard supports the STR (Suspend To RAM) power management scheme by maintaining the appropriate power states in the DDR SDRAM interface signals. The power source to the DDR SDRAM is kept active during STR (ACPI S3). Advanced Configuration Power Interface (ACPI) provides many Energy Saving Features for operating systems that support Instant ON and OuickStartTM function.

- 1. To enable STR functionality to save system power:
 - a. Install ACPI certified add-on cards (such as VGA, LAN, and modem cards).
 - b. In BIOS, under Power Management Setup (refer to Section 4), select "ACPI Suspend Type: S3(STR)". If you have a USB mouse or keyboard, set "USB Resume from S3" to "Enabled".
 - c. When in Windows, open the Control Panel Power Management application, and click the Advanced tab. In the Power buttons section, select "Stand By" from the drop-down lists.
- 2. To activate the STR function:
 - a. Click the START button and choose Shut Down.
 - b. In the Shut Down Windows dialog box, select the Stand By option to enter STR mode.
- The following are the differences between STR power saving mode and Suspend (Power On Suspend) mode:
 - a. STR is the most advanced Power Management mode.
 - b. STR cuts all the power supplied to peripherals except to memory max. power saving.
 - STR saves and keeps all on-screen data including any executed applications to DDR SDRAM.
 - d. In STR mode, you must push the power button (connected to the onboard PW-On of CFP pin), click your USB mouse buttons, or press your USB keyboard keys to wake up your system to the last display.

Section 4 BIOS SETUP

Main Menu

The ROM BIOS contains a built-in Setup program which allows user to modify the basic system configuration and hardware parameters. The modified data is stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added.

It is possible for the CMOS battery to fail causing CMOS data loss. If this happens you will need install a new CMOS battery and reconfigure your BIOS settings.

The BIOS setup screen and description are for reference only, and may not exactly match what you see on your screen. The contents of BIOS are subject to change without notice. Please visit our website for BIOS updates.

To enter the Setup Program:

Power on the computer and press the key during the POST (Power On Self Test). The BIOS CMOS SETUP UTILITY opens.

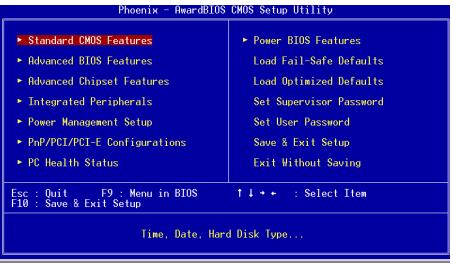


Figure 1: CMOS Setup Utility

The main menu displays all the major selection items. Select the item you need to reconfigure. The selection is made by moving the cursor (press any direction (arrow key) to the item and pressing the 'Enter' key. An on-line help message is displayed at the bottom of the screen as the cursor is moved to various items which provides a better understanding of each function. When a selection is made, the menu of the selected item will appear so that the user can modify associated configuration parameters.

4-1 Standard CMOS Setup

Choose "STANDARD CMOS FEATURES" in the CMOS SETUP UTILITY Menu (Figure 2). Standard CMOS Features Setup allows the user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted (use direction keys to move the cursor and the <Enter> key to select), the entries in the field can be changed by pressing the <PgDn> or the <PgUp> key.

Phoenix − AwardBIOS CMOS Setup Utility Standard CMOS Features			
Date (mm:dd:yy) Time (hh:mm:ss)	Wed, Feb 24 1999 13 : 28 : 44	Item Help	
► IDE Channel 0 Master ► IDE Channel 0 Slave ► IDE Channel 1 Master ► IDE Channel 1 Slave	[None] [None] [None] [None]	Menu Level ► Change the day, month, year and century	
Drive A Halt On	[1.44M, 3.5 in.] [All , But Keyboard]		
Base Memory Extended Memory Total Memory	640K 65472K 1024K		
↑↓++:Move Enter:Select F5: Previous Values	+/-/PU/PD:Value F10:Save F6: Fail-Safe Defaults	ESC:Exit F1:General Help F7: Optimized Defaults	

Figure 2: Standard CMOS Setup

Notes: • If the hard disk Primary Master/Slave and Secondary Master/Slave are set to Auto, the hard disk size and model will be auto-detected.

• The "Halt On." field is used to determine when the BIOS will halt the system if an error occurs.

4-2 Advanced BIOS Features

Selecting the "ADVANCED BIOS FEATURES" option in the CMOS SETUP UTILITY menu allows users to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values for the board. Pressing the [F1] key displays a help message for the selected item.

- AwardBIOS CMOS Setup Utility Phoenix Advanced BIOS Features [Press Enter] [PCI Slot] ► Hard Disk Boot Priority Item Help Init Display First
First Boot Device
Second Boot Device
Third Boot Device
Boot Other Device
Boot Up Floppy Seek
Boot Up NumLock Status [Floppy] [Hard Disk] [LS120] Menu Level Select Hard Disk Boot [Enabled] Device Priority [Enabled] [0n][Setup] Security Option APIC Mode [Enabled] HDD S.M.A.R.T. Capability Video BIOS Shadow [Disabled] Enabledl Full Screen LOGO Show [Fnabled] 11→+:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F6: Fail-Safe Defaults F5: Previous Values F7: Optimized Defaults

Figure 3: BIOS Features Setup

Hard Disk Boot Priority

This item allows you to select the hard disk boot priority.



Init Display First

If two video cards are used (1 AGP and 1 PCI) this specifies which one will be the primary display adapter.

Options: PCI Slot, AGP, PCIE Slot.

First /Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

Options: Floppy, LS120, Hard Disk, CDROM, ZIP100, USB-FDD, USB-CDROM, Legacy LAN, Disabled.

Boot Other Device

When enabled, the system searches all other possible locations for an operating system if it fails to find one in the devices specified under the first, second, and third boot devices. The default is Enabled.

Options: Enabled, Disabled.

Boot Up Floppy Seek

If this item is enabled, it checks the size of the floppy disk drives at start-up time.

You don't need to enable this item unless you have a legacy diskette drive with 360K capacity.

Options: Enabled, Disabled.

Boot Up NumLock Status

This controls the state of the NumLock key when the system boots. The default is On.

On: The keypad acts as a 10-key pad.

Off: The keypad acts like cursor keys.

Security Option

This category allows you to limit access to the System and Setup, or just to Setup.

System: The system will not boot and the access to Setup will be denied if the

correct password is not entered at the prompt.

Setup: The system will boot; but the access to Setup will be denied if the

incorrect password is not entered at the prompt.

APIC Mode

This item allows you to enable APIC (Advanced Programmable Interrupt Controller) functionality. APIC is a chip that provides symmetric multiprocessing (SMP) for its Pentium systems.

Options: Enabled, Disabled.

HDD S.M.A.R.T. Capability

The S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T.

Software resides on both the disk drive and the host computer. If a device failure is predicted, the host software, through the Client WORKS S.M.A.R.T applet, warns the user of the impending condition and advises appropriate action to protect the data. Options: Enabled, Disabled.

Video BIOS Shadow

This option allows video BIOS to be copied into RAM. Video Shadowing will increase the video performance of your system.

Options: Enabled, Disabled.

4-3 Advanced Chipset Features

Choose the "ADVANCED CHIPSET FEATURES" option in the CMOS SETUP UTILITY menu to display following menu.

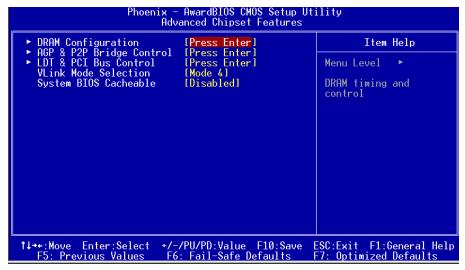


Figure 4: Chipset Features Setup

VLink Mode Selection

This item allows you to select VLink mode.

Options: Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

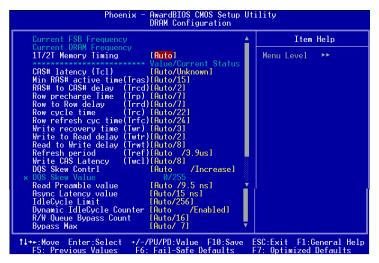
System BIOS Cacheable

This item allows the system to be cached in memory for faster execution.

Options: Disabled, Enabled.

▶ DRAM Configuration

Scroll to DRAM Configuration and press <Enter>. The following screen appears:



Current FSB Frequency

Display the current CPU front side bus frequency information.

Current DRAM Frequency

Display the current DRAM frequency information.

1T/2T Memory Timing

For setting DRAM Timing.

Options: Auto, 1T, 2T.

CAS# Latency (Tcl)

Enables you to select the CAS latency time. The value is set at the factory depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM.

Options: Auto, 2, 2.5, 3.

Min RAS# active time (Tras)

This filed specifies the minimum RAS# active time.

Options: Auto, $5T \sim 15T$.

RAS# to CAS# delay (Trcd)

This filed specifies the RAS# to CAS# delay to read/write command to the same bank.

Options: Auto, $2T \sim 7T$.

Row precharge Time (Trp)

This filed specifies the Row Precharge Time. Precharge to active or Auto-refresh of the same bank.

Options: Auto, $2T \sim 7T$.

Row to Row delay (Trrd)

This filed specifies the Row to Row delay of different banks.

Options: Auto, $2T \sim 4T$.

Row cycle time (Trc)

This filed specifies the Row Cycle Time. RAS# active to RAS# active or auto refresh of the same bank.

Options: Auto, $7T \sim 21T$.

Row refresh cyc time (Trfc)

This filed specifies the Row Refresh Cycle Time. Auto-refresh active to RAS# or RAS# to auto refresh.

Options: Auto, $9T \sim 23T$.

Write recovery time (Twr)

This bits specifies the Write Recovery Time. Called Trd1 by Samsung, measures when the last write datum is safely registered by the DRAM. It measures from the last data to precharge.

Options: Auto, 2, 3.

Write to Read delay (Twtr)

This bits specifies the Write to Read delay. Samsung Calls this Tcd1r (last data in to read command). It is measured from the rising edge following the last non-masked data strobe to the rising edge of the next Read Command. (Jedec spec this as exactly one clock).

Options: Auto, 1, 2.

Read to Write delay (Trwt)

This filed specifies the Read to write delay. This is not a DRAM specified timing parameter but must be considered due to routing latencies on the clock forwarded bus. It is counted from first address but slot which was not associated with part of the read burst.

Options: Auto, $1 \sim 6$.

Refresh period (Tref)

This filed specifies the number of clock cycles between refresh.

Options: Auto, 15.6us, 7.8us, 3.9us.

▶ AGP & P2P Bridge Control

Scroll to AGP & P2P Bridge Control and press <Enter>. The following screen appears:

Phoenix - AwardBIOS CMOS Setup Utility AGP & P2P Bridge Control		
AGP Aperture Size AGP 2.0 Mode AGP Driving Control **AGP Driving Value AGP Fast Write AGP 3.0 Calibration cycle DBI Output for AGP Irans.		Item Help Menu Level →→

AGP Aperture Size

This item defines the size of the aperture if you use an AGP graphics adapter. It refers to a section of the PCI memory address range used for graphics memory. Options: 32M, 64M, 128M, 256M, 1G.

AGP Mode

Chipset AGP Mode support.

Options: 1X, 2X, 4X, 8X.

AGP Driving Control

This item allows you to adjust the AGP driving force. Choose "Manual" to key in a AGP Driving Value in the next selection. This field is recommended to set in "Auto" to avoid any error to your system.

Options: Auto, Manual.

AGP Fast Write

Selecting Enabled allows to use Fast Write Protocol for 4X AGP card.

Options: Enabled, Disabled.

AGP 3.0 Calibration cycle

This item allows you to select AGP 3.0 Calibration cycle function.

▶ LDT & PCI Bus Control

Scroll to LDT & PCI Bus Control and press <Enter>. The following screen appears:



Upstream LDT Bus Width

Options: 8 bit, 16 bit.

Downstream LDT Bus Width

Options: 8 bit, 16 bit.

LDT Bus Frequency

This item sets CPU Hyper Transport front size bus. Options: Auto, 800MHz, 600MHz, 400MHz, 200MHz.

PCI1/2 Master 0 WS Write

When Enabled, Writes to the PCI bus are commanded with zero wait states.

Options: Enabled, Disabled.

PCI1/2 Post Write

Enables CPU to PCI bus POST write.

Options: Enabled, Disabled.

PCI Delay Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.2.

4-4 Integrated Peripherals

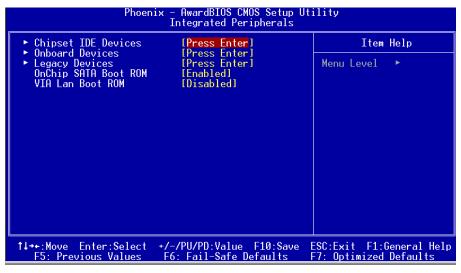


Figure 5: Integrated Peripherals

OnChip SATA Boot ROM/VIA Lan Boot ROM

Enables/disable the onboard SATA/LAN Boot ROM.

Options: Enabled, Disabled.

▶ Chipset IDE Devices

Scroll to Chipest IDE Device and press <Enter>. The following screen appears:



Onchip SATA

Enables the onboard SATA feature.

SATA Mode

This allows you to set RAID mode for Serial ATA devices. Refer to section 5 for more RAID information.

Options: RAID, IDE.

IDE DMA transfer access

Automatic data transfer between system memory and IDE device with minimum CPU intervention. This improves data throughput and frees CPU to perform other tasks.

Options: Enabled, Disabled.

OnChip IDE Channel0/1

The mainboard supports two channel of ordinary IDE interface. Select "Enabled" to activate each channel separately.

Options: Enabled, Disabled.

Note: If you do not use the onboard IDE connector, set the Onboard Primary PCI IDE and Onboard Secondary PCI IDE to "Disabled".

IDE Prefetch Mode

Selecting "Enabled" reduces latency between each drive read/write cycle, but may cause instability in IDE subsystems that cannot support such fast performance. If you are getting disk drive errors, try setting this value to Disabled. This field does not appear when the Internal PCI/IDE field, above, is Disabled.

Options: Enabled, Disabled.

Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 to 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

Options: Auto, Mode $0 \sim 4$.

Primary/Secondary Master/Slave UDMA

Select the mode of operation for the IDE drive. Ultra DMA-33/66/100/133 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and your

system software both support Ultra DMA-33/66/100/133, select Auto to enable UDMA mode by BIOS.

Options: Auto, Disabled.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

Options: Enabled, Disabled.

Onboard Device

Scroll to Onboard Device and press <Enter>. The following screen appears:

Phoenix - AwardBIOS CMOS Setup Utility Onboard Devices		
VIA AC97 Audio VIA Lan Device	[Auto]	Item Help
VIH Lan MeVice VIA Lan MAC Address Input OnChip USB Controller OnChip EHCI Controller USB Device Function USB Keyboard Support USB Mouse Support		Menu Level ►►

AC97 Audio

This item allows you to disable the chipset on-chip support for AC97 Audio.

Options: Auto, Disabled.

VIA LAN Device

Enables the onboard LAN feature.

Options: Auto, Disabled.

Onchip USB Controller

Enables the USB controller.

Options: Enabled, Disabled.

Onchip EHCI Controller

Enables the EHCI (USB2.0) controller.

Options: Enabled, Disabled.

USB Keyboard Support

Enable/disable support for USB keyboard under DOS.

USB Mouse Support

Enable/disable support for USB mouse under DOS.

Options: Enabled, Disabled.

▶ Legacy Devices

Scroll to Legacy Deivces and press <Enter>. The following screen appears:



Onboard FDC Controller

Select "Enabled" if you wish to use onboard floppy disk controller (FDC). If you install an external FDC or the system has no floppy drive, select "Disabled "in this field.

Options: Enabled, Disabled.

Onboard Serial Port 1

Select an address and corresponding interrupt for the serial port.

Options: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

Infrared Port Select

Select an address and corresponding interrupt for the Infrared port.

Options: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

Onboard Parallel Port

This field allows the user to configure the LPT port.

Options: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled.

Parallel Port Mode

This field allows the user to select the parallel port mode.

Options: SPP, EPP, ECP, ECP+EPP.

EPP Mode Select

This field allows the user to select the EPP mode for parallel port mode.

Options: EPP1.9, EPP1.7.

4-5 Power Management Setup

Choose the "Power Management setup" in the CMOS Setup Utility to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it's absolutely necessary.

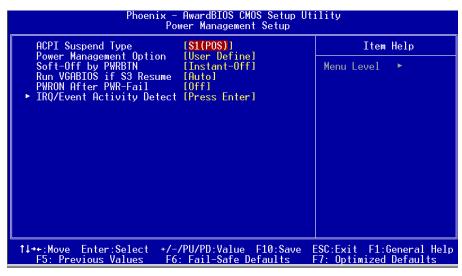


Figure 6: Power Management

ACPI Suspend Type

This item allows you to select S1(Power-On-Suspend) or S3(Suspend-To-RAM) function. When set to "S3(STR)" or "S1&S3" the following two fields become available. Options: S1(POS), S3(STR), S1&S3.

Power Management Option

Use this to select your Power Management selection. The default is User define.

Max. saving: Maximum power savings. Inactivity period is 1 minute in each mode. Min. saving: Minimum power savings. Inactivity period is 1 hour in each mode. User define: Allows user to define PM Timers parameters to control power saving mode.

Soft-Off by PWRBTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung." The default is Instant-off. Options: Delay 4 Sec, Instant-Off.

Page 4-14

Run VGABIOS if S3 Resume

This determines whether or not to enable the system to run the VGA BIOS when resuming from S3(STR) or S1&S3.

Options: Auto, Yes, No.

PWRON After PWR-Fail

This item enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

Off: The system stays off after a power failure.

Former-Sts: The system returns to the state it was in just prior to the power

failure.

► IRQ/Event Activity Detect

Scroll to IRQ/Event Activity Detect and press <Enter>. The following screen appears:



PS2KB Wakeup Select

This item allows you to select Hot Key or Password to wake-up the system by PS2 Keyboard. If Password is selected, press <Enter> key to change a password with max 8 numbers.

Options: Hot key, Password.

PS2KB Wakeup form S3/S4/S5

This item allows you to set a Hot Key to wake-up the system by PS2 Keyboard. Options: Disabled, Ctrl+F1, Ctrl+F2, Ctrl+F3, Ctrl+F4, Ctrl+F5, Ctrl+F6, Ctrl+F7,

Ctrl+F8, Ctrl+F9, Ctrl+F10, Ctrl+F11, Ctrl+F12, Power, Wake, Any key.

Note: Power and Wake are Windows98 Keyboard button.

PS2MS Wakeup form S3/S4/S5

This item allows you to wake-up the system by PS2 Mouse.

USB Wake-Up From S3

This item allows a USB device to wake-up the system from S3 suspend state.

Options: Enabled, Disabled.

PowerOn by PCI Card

An input signal from PME on the PCI card awakens the system from soft-off state. Options: Enabled, Disabled.

PowerOn by Onboard LAN

When enabled, LAN activity awakens the system from soft-off state.

Options: Enabled, Disabled.

Modem Ring Resume

When set to "Enabled", any event occurring to the Modem Ring will awaken the system from suspend state.

Options: Enabled, Disabled.

RTC Alarm Resume

When set to Enable rtc alarm resume, you can set the date (of month) and time (hh:mm:ss), that will awaken a system which has been powered down.

4-6 PNP/PCI/PCI-E Configuration

This page lets the user to modify the PCI IRQ signals when various PCI cards are inserted.

WARNING: Conflicting IRQ's may cause system unable to locate certain devices.

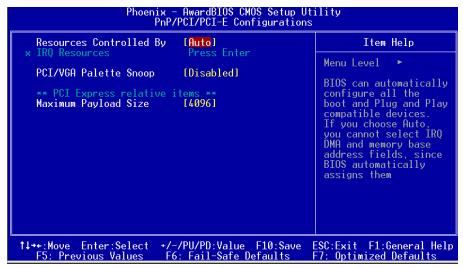


Figure 7: PNP/PCI/PCI-E Configuration Setup

Resources Controlled By

Determines what controls system PNP/PCI/PCI-E resources. The default is Auto (ESCD).

Manual: PNP Card's resources are controlled manually. The "IRQ Resources" field

becomes available and you can set which IRQ-X and DMA-X are

assigned to PCI and onboard devices.

Auto: BIOS assigns the interrupt resource automatically.

PCI/VGA Palette Snoop

This item is designed to overcome problems that may be caused by some nonstandard VGA cards.

Options: Enabled, Disabled.

*** PCI Express related items ***

Maximum Payload Size

Set maximum TLP payload size for the PCI Express devices. The unit is byte.

Options: 128, 256, 512, 1024, 2048, 4096.

4-7 PC Health Status

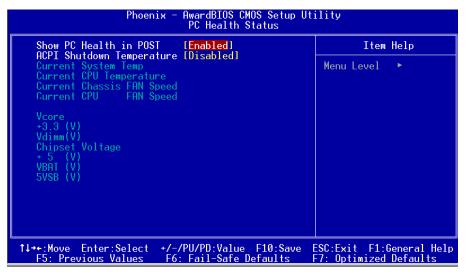


Figure 8: PC Health Status

Show PC Health in POST

When this function is enabled the PC Health information is displayed during the POST (Power On Self Test).

Options: Disabled, Enabled.

Shutdown Temperature

This is the temperature that the computer will turn off the power to combat the effects of an overheating system. (requires ACPI to be enabled in Power Management BIOS and ACPI compliant operating system.) The default is Disabled. Options available are 60°C/140°F to 90°C/194°F in increments of 5°C.

Current System/CPU Temperature

Displays the current system/CPU temperature.

Current CHASSIS/CPU FAN Speed

Displays the current speed of the CPU, and chassis fan speed in RPMs.

Vcore

The voltage level of the CPU(Vcore).

Vdimm

The voltage level of the DRAM.

Chipset Voltage

The voltage level of the chipset voltage.

VBAT(V)

The voltage level of the battery.

+3.3(V), +5(V), 5VSB(V)

The voltage level of the switching power supply.

4-8 Power BIOS Features

This page lets you adjust various parameters to obtain improved performance for overclocking.

Warning:

Overclocking requires expert knowledge and risks permanent damage to system components. We recommend you leave these parameters at their default values for proper operation.

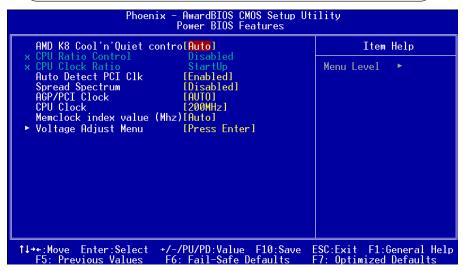


Figure 9: Frequency/Voltage Control

AMD K8 Cool'n'Quiet control

Reduce the noise and heat from you PC when AMD's Cool'n'QuietTM technology is enabled.

Options: Auto, Disabled.

CPU Ratio Control

This item allows you to enable the CPU clock ratio control. Choose "Enabled" to key in a CPU clock Ratio in the next selection.

Options: Enabled, Disabled.

CPU Clock Ratio

Use this item to select a multiplier to set the CPU frequency. See CPU Clock item below for explanation.

Auto Detect PCI CIk

When enabled the mainboard automatically disables the clock source for a PCI slot which does not have a module in it, reducing EMI (ElectroMagnetic Interference). Options: Enabled, Disabled.

Spread Spectrum

If you enable spread spectrum, it can significantly reduce the EMI (ElectroMagnetic Interference) generated by the system.

Options: Disabled, Enabeld.

AGP/PCI Clock

Enables you lock the AGP/PCI clock to a defined frequency or float with the host bus.

Options: Auto, By FSB, 66.6/33.3MHz, 75.0/37.5MHz.

AGP clock is always double of PCI clock.

AGP clock = PCI clock x 2

CPU Clock

Enables you to increment the CPU's clock generator at 1MHz step. This works together with CPU Clock Ratio (above) to set the CPU operating frequency.

CPU Clock Generator x CPU Clock Ratio = CPU Frequency

For example, if you have a processor that is rated at 2.4GHz and the clock generator is 200MHz, then 200MHz x 12 = 2.4GHz

Press <Enter> to display the following screen:



Key in the DEC (decimalism) number for the CPU clock.



Overclocking failure will cause no display on the monitor. To overcome this switch off the power supply and switch on again. Restart the system, press and hold *Insert*> key. This will revert the BIOS to default or initial setting.

Memclock index value (Mhz)

This item sets the memory clock. By placing an artificial memory clock limit on the system, memory is prevented from running faster than this frequency. Example, "200" will set to DDR400 speed.

Options: Auto, 100Mhz, 133Mhz, 166Mhz, 200Mhz.

▶ Voltage Adjust Menu

Scroll to Voltage Adjust Menu and press <Enter>. The following screen appears:





In the following items, "Default Voltage" indicates the original factory value, and "New Voltage" indicates the value that you assign.

CPU Vcore Voltage

This item allows you to adjust the CPU Vcore voltage.

Options: -0.175V to +0.475V in 0.025V increments. We recommend that you leave this at the default value.

DIMM Voltage

This item allows you to adjust the DIMM slot voltage.

Options: +0.00V to +0.70V in 0.10V increments. We recommend that you leave this at the default value

Chip Voltage

This item allows you to adjust the chip voltage.

Options: +0.00V to +0.30V in 0.10V increments. We recommend that you leave this at the default value.

4-9 Defaults Menu

Selecting "Defaults" from the main menu shows you two options which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box:

Load Fail-Safe Defaults (Y/N)? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box:

Load Optimized Defaults (Y/N)? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4-10 Supervisor/User Password Setting

This function lets you set either Supervisor or User Password, or both, to prevent unauthorized changes to BIOS menus.

supervisor password: full rights to enter and change options of the setup menus.

user password: only enter but no rights to change options of the setup

menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

When a password has been enabled, you will be prompted to key in each time you enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You can determine when the password is required within the Advanced BIOS Features Menu and its Security option. If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4-11 Exiting BIOS

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Section 5 S-ATA RAID CONFIGURATION

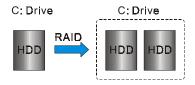
Introduction

This section gives a brief introduction on RAID-related background knowledge and a general procedure to setup RAID system on this mainboard.

RAID Basics

RAID (Redundant Array of Independent Disks) is a method of combining two or more hard disk drives into one logical unit known as a RAID array. The advantage of RAID is to provide better performance or data fault tolerance. Fault tolerance is achieved through data redundant operation, where if one drives fails, a mirrored copy of the data can be found on another drive. This can prevent data loss if the operating system fails or hangs.

Below is an example of a RAID array with 2 drives.



The individual disk drives in an array are called "members". All disk members in a formed disk array are recognized as a single physical drive to the operating system.

Hard disk drives can be combined together through a few different methods. The different methods are referred to as different RAID levels. Different RAID levels represent different performance levels, security levels and implementation costs. The table below briefly introduced these RAID levels.

RAID Level	No. of Drives	Capacity	Benefits
RAID 0 (Striping)	2	Number drivers *Smallest size	Highest performance without data protection
RAID 1 (Mirroring)	2	Smallest size	Data protection
JBOD (Spanning)	2	Sum of All drivers	No data protection and performance improving, but disk capacity fully used.

S-ATA RAID Configuration

RAID 0 (Striping)

RAID 0 reads and writes sectors of data interleaved between multiple drives. If any disk member fails, it affects the entire array. The disk array data capacity is equal to the number of drive members times the capacity of the smallest member. The striping block size can be set from 4KB to 64KB. RAID 0 does not support fault tolerance.

RAID 1 (Mirroring)

RAID 1 writes duplicate data onto a pair of drives and reads both sets of data in parallel. If one of the mirrored drives suffers a mechanical failure or does not respond, the remaining drive will continue to function. Due to redundancy, the drive capacity of the array is the capacity of the smallest drive. Under a RAID 1 setup, an extra drive called the "spare drive" can be attached. Such a drive will be activated to replace a failed drive that is part of a mirrored array. Due to the fault tolerance, if any RAID 1 drive fails, data access will not be affected as long as there are other working drives in the array.

JBOD (Spanning)

A spanning disk array is equal to the sum of the all drives when the drives used are having different capacities. Spanning stores data onto a drive until it is full, then proceeds to store files onto the next drive in the array. When any disk member fails, the failure affects the entire array. JBOD is not really a RAID and does not support fault tolerance.

Others

Other RAID derivatives are RAID 10 and RAID 5. These RAID levels require more than 2 drives to operate, combining the benefits of RAID 0 and RAID 1.

This mainboard is equipped with the following SATA RAID controllers:

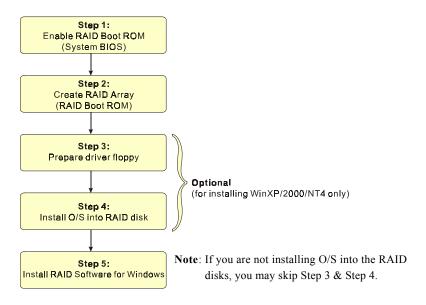
VIA S-ATA RAID Features

The VIA S-ATA RAID solution uses the VT8237R chip as a RAID controller, which is a 2-channel S-ATA solution. Listed below are the main features and benefits of VIA S-ATA RAID:

- Support two S-ATA hard disk drives.
- Supports hard disk drive larger than 137 GB (48-bits LBA).
- Supports RAID 0, 1 and JBOD.
- 4 KB to 64 KB striping block size support.
- Bootable disk or disk array support.
- Windows-based RAID configure and management software tool. (Compatible with BIOS)
- Real-time monitoring of device status and error alarm with popup message box and beeping.
- Mirroring automatic background rebuilds support.
- ATA SMART function support.
- Microsoft Windows 98, Me, NT4.0, 2000, XP operating systems support.
- Event log for easy troubleshooting.
- On-line help for easy operation for RAID software.

Enable RAID Function

For any RAID controller, the general procedure to enable RAID function are shown below:



Step 1: Enable RAID ROM

The system BIOS may disable all RAID function by default. To enable any RAID controller you must enable its RAID Boot ROM. Enter the BIOS CMOS Setup and jump to Integrated Peripherals Page.



Select the controller's Boot ROM and set it to Enabled. Press "F10" to Save & Exit.

Step 2: Create RAID Array

RAID arrays are created using the RAID controller's BIOS utility.

▶ VIA VT8237R

Power-on the system and wait for the following screen to appear. Press the "Tab" key to enter its BIOS configuration utility.

```
UIA Technologies, Inc. UIA UT6420 BAID BIOS Setting Utility U0.94
Copyright (C) UIA Technologies, Inc. All Right reserved.
Press ( 7 ab ) key into User Vindou!
Stan Devises, Province Walter Vindou!
Channel B Moster: Maxtor (V9600M0
Channel I Master: Maxtor (V9600M0
```

The main interface of the BIOS utility is as below:

```
UIA Tech. RAID BIOS Ver 8.94

Create a RAID array with the hard disk attached to UIA IDE controller

Select Boat Array

Serial Number View

Channel

Channel

Drive Name

Array Name

Array Array

Array

Array

Fig. 10 view Array/disk Status

Fig. 10 view on ext item

Complies to next item

Channel

Channel

Array Name

Array Name
```

Refer to Appendix B for details about creating RAID array using this utility. After the RAID array is created, press "ESC" to exit.

Step 3: Prepare driver floppy

When installing Windows XP/2000/NT4.0 into any RAID disk, the O/S setup will require a floppy disk containing the RAID driver. This step will show you how to prepare this driver floppy. There are 2 methods to prepare this floppy:

Method 1

- 1. Insert the bundled CD into the CD-ROM drive
- 2. Boot the system from the CD-ROM
- 3. A menu of driver for various RAID controllers will appear
- 4. Insert a blank floppy into the A:drive
- 5. Select the appropriate RAID controller to begin copy into the floppy

S-ATA RAID Configuration

Method 2

- 1. Locate another computer and insert the bundled CD into its CD-ROM drive.
- 2. A main menu screen will appear (Autorun feature)
- 3. Select the page "RAID floppy"



- 4. Insert a blank floppy into the A:drive
- 5. Click on the required driver to begin copy into the floppy

Step 4: Install O/S into RAID disk

Proceed to install Windows XP/2000/NT4.0. When installing the O/S from CD, press <**F6**> so that it will request for RAID driver. Insert the floppy created earlier in Step 3.

Step 5: Install Software utility for Windows

After the O/S has been installed, you may install the RAID driver and software. The RAID software is a Windows-based utility with graphical user interface that provides an easy operating tool to configure and manage RAID arrays.

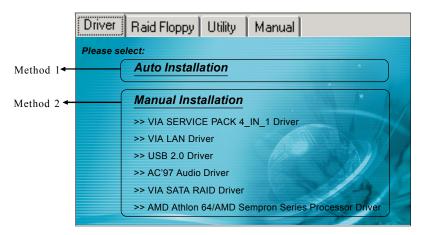
- 1) Insert the bundled CD into the CD-ROM drive.
- 2) When the main menu appears, click on the RAID driver corresponding to the RAID controller you have configured in Step 2. See driver installation in section 6 for more details.

Note: For information on using the software utility, refer to the user guide in the bundled CD.

Section 6 DRIVER INSTALLATION

Easy Driver Installation

Once the operating system has been installed, you need to install the drivers for the mainboard.



Insert the bundled CD into the CD-ROM and the main menu screen will appear. The main menu displays links to the supported drivers, utilities and software.

Method 1

This item installs all drivers automatically.

Method 2

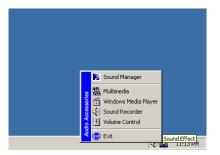
This item allows you to install the drivers selectively.

- Step 1: Click "VIA SERIES 4_IN_1 Driver" to install chipset driver.
- Step 2: Click "VIA LAN Driver" to install LAN driver.
- Step 3: Click "USB V2.0 Driver" to install USB 2.0 driver.
- Step 4: Click "AC'97 Audio Driver" to install audio driver.
- Step 5: Click "VIA SATA RAID Driver" to install Serial ATA RAID driver.
- Step 6: Click "AMD Athlon 64 / AMD Sempron Series Processor Driver" to install AMD series processor driver.

Realtek Sound Manager Quick User-guide

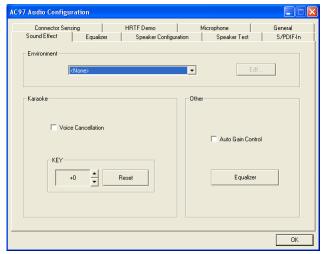
Introduction

To obtain the best performance from your audio system, run the "Sound Manager" utility to adjust the settings to suit your needs. This section of the manual is intended to provide a quick user-guide to setup "Sound Manager". For more detailed information, refer to "Sound Manager manual" in the CD.



<Figure 1>

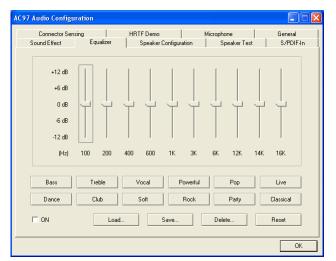
1. Right-click "Sound Effect" button on the task bar and select "Sound Manager".



Sound Effect:

<Figure 2>

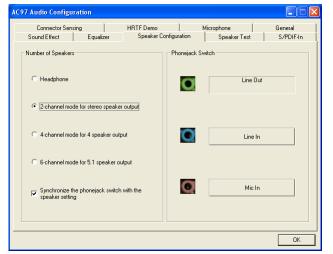
- 2. Select "Sound Effect" page to set the desired audio environment from the pull-down menu. There are in total 23 kinds of sound effect.
 - a. For Karaoke function, "Voice Cancellation (only for 2 channels mode)" removes the human voice. "Key" lets you adjusts the key pitch.
 - b. "Auto Gain Control" avoids saturation when adjusting the equalizer.



Equalizer:

<Figure 3>

3. There are 10 bands of equalizer control, check "ON" when you want to adjust the equalizer.



Speaker Configuration:

<Figure 4>

4. This page displays the mainboards's phone jack function when a corresponding audio mode (no. of speaker) is selected.

Figure 4 above shows the phone jack setup for 2 channel mode.

Driver Installation



Speaker Test:

<Figure 5>

5. To test the speaker, select the "Speaker Test" page and click directly on the speakers shown on the screen.

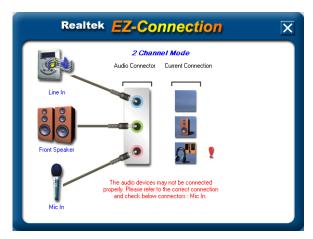
This board is equipped with Jack Sensing capability. If an audio device is plugged into the wrong connector, a warning message will appear to remind users to check the connection.



Connector Sensing:

<Figure 6>

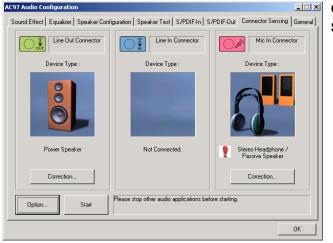
6. Push "Start" button to start the sensing. Please remember to terminate all audio applications before starting the sensing.



Connector Sensing:

<Figure 7>

- 7. EZ-Connection shows the result of the detection.
 - "Audio Connector" column reflects the settings used in the "Speaker Configuration" page.
 - "Current Connection" column shows the type of device detected. If the results do not match, an exclamation mark will appear on the right side.



Connector Sensing:

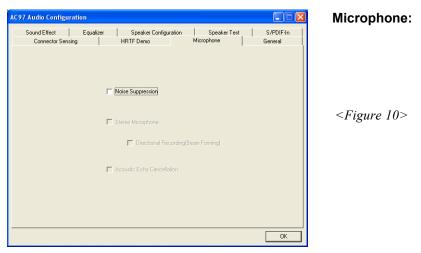
<Figure 8>

8. After closing EZ-Connector, this page will show the latest connector status as above.

Driver Installation



9. This page lets you test the HRTF 3D Positional Audio features.



10. The "Noise Suppression" feature uses software to reduce background delay microphone recording.



General:

<Figure 11>

11. This page displays information regarding the audio hardware and software.

To remove "Sound Manager" icon from Windows Task bar, uncheck "Show icon in system tray".

Driver Installation

Appendix A

A-1 Update Your System BIOS

Download the xxxxx.EXE file corresponding to your model from our website to an empty directory on your hard disk or floppy. Run the downloaded xxxxx.EXE file and it will self extract. Copy these extracted files to a bootable floppy disk.

Note: The floppy disk should contain NO device drivers or other programs.

- 1. Type "A:\AWDFLASH and press <Enter> Key.
- 2. You will see the following setup screen.
- 3. Please key in the xxxxx.bin BIOS file name.

```
FLASH MEMORY MRITER V7.88

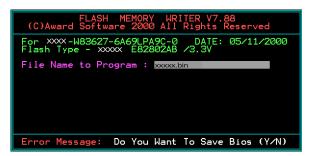
(C)Award Software 2000 All Rights Reserved

For XXX - W83627 - 6A69LPA9C - 0 DATE: 05/11/2000

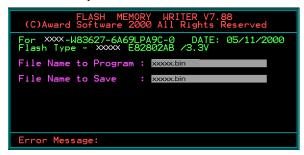
Flash Type -

File Name to Program :
```

4. If you want to save the previous BIOS data to the diskette, please key in [Y], otherwise please key in [N].

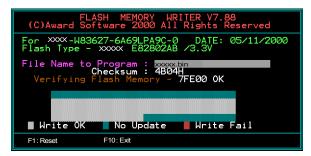


5. Key in File Name to save previous BIOS to file.



6. To confirm and proceed, please key in [Y] to start the programming.

7. The BIOS update is finished.



Appendix B

B-1 VIA RAID BIOS Utility

Power-on the system and wait for the following screen to appear. Press the "Tab" key to enter its BIOS configuration utility.

```
UIA Technologies, Inc. UIA UT6420 RAID BIOS Setting Utility U0.94
Copyright (C) UIA Technologies, Inc. All Right reserved.
Press < Tab > key into User Window!
Scan Devices, Please wait...
Channel 0 Master: Maxtor 61060M0
Channel 1 Master: Maxtor 61060M0
```

The main interface of the BIOS utility is as below:

Create Disk Array

 Use the arrow keys to navigate the main menu. Use the up and down arrow keys to select the Create Array command and press <Enter> to call out the list of creation steps.



2. Select Array Mode and press <Enter>, a list of array modes will appear. Highlight the target array mode that you want to create, and press <Enter> to confirm the selection. If RAID 1 is selected, an option list will popup and enable the users to select Create only or Create and duplicate. Create only will allow BIOS to only create an array. The data on the mirroring drive may be different from the source drive. Create and duplicate lets BIOS copy the data from the source to the mirroring drive.



3. After array mode is selected, there are two methods to create a disk array. One method is "Auto Setup" and the other one is "Select Disk Drives". Auto Setup allows BIOS to select the disk drives and create arrays automatically, but it does not duplicate the mirroring drives even if the user selected Create and duplicate for RAID 1. It is recommended all disk drives are new ones when wanting to create an array. Select Disk Drives lets the user select the array drives by their requirements. When using Select Disk Drives, the channel column will be activated. Highlight the target drives that you want to use and press <Enter> to select them. After all drives have been selected, press <Esc> to go back to the creation steps menu.



4. If user selects a RAID 0 array in step 2, the block size of the array can also be selected. Use the arrow key to highlight **Block Size** and press <Enter>, then select a block size from the popup menu. The block size can be 4KB to 64KB.



- 5. Use the arrow key to highlight **Start Create Process** and press <Enter>. A warning message will appear, Press **Y** to finish the creation, or press **N** to cancel the creation.
- 6. Important note: All existing content in the hard drive will be destroyed after array creation.

Delete Disk Array

A RAID can be deleted after it has been created. To delete a RAID, use the following steps:

- 1. Select **Delete Array** in the main menu and press <Enter>. The channel column will be activated.
- Select the member of an array that is to be deleted and press <Enter>.
 A warning message will show up, press Y to delete or press N to cancel.



Appendix

Deleting a disk array will destroy all the data on the disk array except RAID 1 arrays. When a RAID is deleted, the data on these two hard disk drives will be reserved and become two normal disk drives.

View Serial Number of Hard Drive

Highlight **Serial Number View** and press <Enter>. Use arrow key to select a drive, the selected drive's serial number can be viewed in the last column. The serial number is assigned by the disk drive manufacturer.

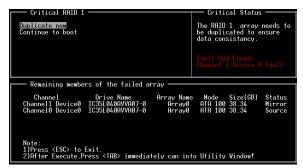
View Array Status

Press the **F1** key to show the array status on the lower screen. If there are no disk arrays then nothing will be displayed on the screen.



Duplicate Critical RAID 1 Array

When booting up the system, BIOS will detect if the RAID 1 array has any inconsistencies between user data and backup data. If BIOS detects any inconsistencies, the status of the disk array will be marked as critical, and BIOS will prompt the user to duplicate the RAID 1 in order to ensure the backup data consistency with the user data.



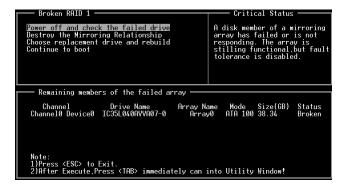
If user selects **Continue to boot**, it will enable duplicating the array after booting into OS.

Rebuild Broken RAID 1 Array

When booting up the system, BIOS will detect if any member disk drives of RAID has failed or is absent. If BIOS detects any disk drive failures or missing disk drives, the status of the array will be marked as broken.

If BIOS detects a broken RAID 1 array but there is a spare hard drive available for rebuilding the broken array, the spare hard drive will automatically become the mirroring drive. BIOS will show a main interface just like a duplicated RAID 1. Selecting **Continue to boot** enables the user to duplicate the array after booting into operating system.

If BIOS detects a broken RAID 1 array but there is no spare hard drive available for rebuilding the array, BIOS will provide several operations to solve such problem.



1. Power off and Check the Failed Drive:

This item turns off the computer and replaces the failed hard drive with a good one. If your computer does not support APM, you must turn off your computer manually. After replacing the hard drive, boot into BIOS and select **Choose replacement drive and rebuild** to rebuild the broken array.

2. Destroy the Mirroring Relationship:

This item cancels the data mirroring relationship of the broken array. For broken RAID 1 arrays, the data on the surviving disk will remain after the destroy operation.

3. Choose Replacement Drive and Rebuild:

This item enables users to select an already-connected hard drive to rebuild the broken array. After choosing a hard drive, the channel column will be activated.



Highlight the target hard drive and press <Enter>, a warning message will appear. Press Y to use that hard drive to rebuild, or press N to cancel. Please note selecting option Y will destroy all the data on the selected hard drive.

4. Continue to boot:

This item enables BIOS to skip the problem and continue booting into OS.

Appendix C

C-1 POST CODES

	<u></u>
POST (hex)	DESCRIPTION
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization:
	- Disable shadow RAM
	- Disable L2 cache (socket 7 or below)
	 Program basic chipset registers
C1h	Detect memory
	 Auto-detection of DRAM size, type and ECC.
	- Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
01h	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen
	2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface
	2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O
	chips.
221	2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional).
	2. Auto detect ports for keyboard & mouse followed by a port &
	interface swap (optional).
0D 0DI	3. Reset keyboard for Winbond 977 series Super I/O chips.
0B-0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test
OEL	fails, keep beeping the speaker. Reserved
0Fh 10h	
1011	Auto detect flash type to load appropriate flash R/W codes into the run
11h	time area in F000 for ESCD & DMI support. Reserved
1111 12h	
1211	Use walking 1's algorithm to check out interface in CMOS circuitry.
13h	Also set real-time clock power status, and then check for override. Reserved
1311 14h	
1411	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early Init Onboard Generator switch.
17h	Reserved
1 / 11	IVESEI AER

Appendix

18h Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686). 19-1Ah Reserved 1Bh Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS INT HDLR & S/W interrupts to SPURIOUS soft HDLR. 1Ch Reserved Initial EARLY PM INIT switch. 1Dh 1Eh Reserved 1Fh Load keyboard matrix (notebook platform) 20h Reserved 2.1h HPM initialization (notebook platform) 22h Reserved 23h 1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. Early PCI initialization: 5. -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0. 24-26h 2.7h Initialize INT 09 buffer 28h Reserved Program CPU internal MTRR (P6 & PII) for 0-640K memory 29h 1. address 2. Initialize the APIC for Pentium class CPU. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. Invoke video BIOS. 2A-2Ch Reserved 2Dh 1. Initialize multi-language Put information on screen display, including Award title, CPU type, CPU speed 2E-32h Reserved 33h Reset keyboard except Winbond 977 series Super I/O chips. 34-3Bh Reserved 3Ch Test 8254 3Dh Reserved 3Eh Test 8259 interrupt mask bits for channel 1. 3Fh Reserved 40h Test 8259 interrupt mask bits for channel 2. 41h Reserved 42h Reserved

43h	Test 8259 functionality.
44h	Reserved
45-46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K
	page.
	Program writes allocation for AMD K5 CPU.
4A-4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU
	2. Initialize L2 cache for P6 class CPU & program CPU with proper
	cacheable range.
	3. Initialize the APIC for P6 class CPU.
	4. On MP platform, adjust the cacheable range to smaller one in case
	the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53-54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo
	2. Early ISA PnP initialization
	-Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE
	from FDD (optional)
5Ch	Reserved
5Dh	1. Initialize Init Onboard Super IO switch.
	2. Initialize Init Onbaord AUDIO switch.
5E-5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter
	the CMOS setup utility.
61-64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-
	configuration table.
6Ch	Reserved
6Dh	 Assign resources to all ISA PnP devices.
	2. Auto assign ports to onboard COM ports if the corresponding item
	in Setup is set to "AUTO".

Appendix

6Eh	Reserved	
6Fh	1. Initialize floppy controller	
	2. Set up floppy related fields in 40:hardware.	
70-72h	Reserved	
73h	(Optional Feature) Enter AWDFLASH.EXE if:	
	-AWDFLASH is found in floppy drive.	
	-ALT+F2 is pressed	
74h	Reserved	
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM	
76h	Reserved	
77h	Detect serial ports & parallel ports.	
78h-79h	Reserved	
7Ah	Detect & install co-processor	
7B-7Eh	Reserved	
7Fh	1. Switch back to text mode if full screen logo is supported.	
	-If errors occur, report errors & wait for keys	
	-If no errors occur or F1 key is pressed to continue:	
	 Clear EPA or customization logo. 	
80h-81h	Reserved	
82h	Call chipset power management hook.	
0211	2. Recover the text font used by EPA logo (not for full screen logo)	
	3. If password is set, ask for password.	
83h	Save all data in stack back to CMOS	
84h	Initialize ISA PnP boot devices	
85h	1. USB final Initialization	
0311	2. NET PC: Build SYSID structure	
	3. Switch screen back to text mode	
	4. Set up ACPI table at top of memory.	
	5. Invoke ISA adapter ROMs	
	6. Assign IRQs to PCI devices	
	7. Initialize APM	
86-92h	Clear noise of IRQs. Reserved	
93h	Read HDD boot sector information for Trend Anti-Virus code	
94h		
9411	1. Enable L2 cache	
	 Program boot up speed Chipset final initialization. 	
	5. Clear screen & display summary table	
	6. Program K6 write allocation	
0.51	7. Program P6 class write combining	
95h	Program daylight saving	
0.61	2. Update keyboard LED & typematic rate	
96h	1. Build MP table	
	2. Build & update ESCD	
	3. Set CMOS century to 20h or 19h	
	4. Load CMOS time into DOS timer tick	
	5. Build MSIRQ routing table.	
FFh	Boot attempt (INT 19h)	